



Program Guidebook

Master of Arts in Mathematics Education (Secondary)

The Master of Arts in Mathematics Education (Secondary) is a competency-based degree program that prepares already licensed teachers both to be licensed to teach mathematics in middle grades and to develop significant skills in mathematics curriculum development, design, and evaluation. All work in this degree program is online and includes Middle School Mathematics Content and Mathematics Education. All students complete a culminating Teacher Work Sample.

Understanding the Competency-Based Approach

Practically speaking, how do competency-based programs like those offered at Western Governors University (WGU) work? Unlike traditional universities, WGU does not award degrees based on completion of a certain number of credit hours or a certain set of required courses. Instead, you will earn your degree by demonstrating your skills, knowledge, and understanding of important concepts.

Progress through a degree program is governed not by the amount of time you spend in class but by your ability to demonstrate mastery of competencies as you complete required courses. Of course, you will need to engage in learning experiences as you review competencies or develop knowledge and skills in areas in which you may be weak. To help you acquire the knowledge and skills you need to complete your courses and program, WGU provides a rich array of learning resources. Your program mentor will work closely with you to help you understand the competencies required for your program and to help you create a schedule for completing your courses. You will also work closely with course instructors as you engage in each of your courses. As subject matter experts, course instructors will guide you through the content you must master to pass the course assessments.

The benefit of this competency-based system is that it enables students who are knowledgeable about a particular subject to make accelerated progress toward completing a degree, even if they lack college experience. You may have gained skills and knowledge of a subject while on the job, accumulated wisdom through years of life experience, or already taken a course on a particular subject. WGU will

pre-assessments are there to help your program mentor form a profile of your prior knowledge and create a personalized Degree Plan.

How You Will Interact with Faculty

At WGU, faculty serve in specialized roles, and they will work with you individually to provide the guidance, instruction, and support you will need to succeed and graduate. As a student, it is important for you to take advantage of this support. It is key to your progress and ultimate success.

Upon your enrollment, you will be assigned a program mentor—an expert in your field of study who will provide you with regular program-level guidance and support from the day you start until the day you graduate. Your program mentor will set up regular telephone appointments (weekly at first) with you, which you will be expected to keep. The mentor will review program competencies with you and work with you to develop a plan and schedule for your coursework. Your program mentor will serve as your main point of contact throughout your program—helping you set weekly study goals, recommending specific learning materials, telling you what to expect in courses, and keeping you motivated. In addition to regular calls, your program mentor is available to help you resolve questions and concerns as they arise.

For many of the courses at WGU, you will be required to complete performance assessments. These include reports, papers, presentations, and projects that let you demonstrate your mastery of the required competencies. A separate group of faculty members, called evaluators, will review your work to determine whether it meets requirements. Evaluators are also subject matter experts in their field of evaluation. If your assessment needs further work before it “passes,” these evaluators, who review your work anonymously, will provide you with instructional feedback to help you meet evaluation standards and allow you to advance.

Connecting with Other Mentors and Fellow Students

As you proceed through your Degree Plan, you will have direct contact with multiple faculty members. These communications can take a variety of forms, including participation in one-on-one discussions, chats in the learning communities, and live cohort and webinar opportunities. As a WGU student, you will have access to your own personal MyWGU Student Portal, which will provide a gateway to your courses of study, learning resources, and learning communities where you will interact with faculty and other students.

The learning resources in each course are specifically designed to support you as you develop competencies in preparation for your assessments. These learning resources may include reading materials, videos, tutorials, cohort opportunities, community discussions, and live discussions that are guided by course instructors who are experts in their field. You will access your program community during your orientation course to network with peers who are enrolled in your program and to receive continued support through professional enrichment and program-specific chats, blogs, and discussions. WGU also provides Student Services associates to help you and your program mentor solve any special problems that may arise.

Orientation

The WGU orientation course focuses on acquainting you with WGU's competency-based model, distance education, technology, and other resources and tools available for students. You will also utilize WGU program and course communities, participate in activities, and get to know other students at WGU. The orientation course must be completed before you can start your first term at WGU.

Transferability of Prior College Coursework

Because WGU is a competency-based institution, it does not award degrees based on credits but rather on demonstration of competency. WGU undergraduate programs may accept transfer credits or apply a

'Requirement Satisfied' (RS) in some cases. Refer to your specific program transfer guidelines to determine what can be satisfied by previously earned college credits. In most cases, WGU does not accept college transfer credits at the graduate (master's) level. Students entering graduate programs must have their undergraduate degree transcripts verified before being admitted to WGU. In addition to a program's standard course path, there may be additional state-specific requirements.

[Click here for the Student Handbook](#)

WGU does not waive any requirements based on a student's professional experience and does not perform a "résumé review" or "portfolio review" that will automatically waive any degree requirements. Degree requirements and transferability rules are subject to change in order to keep the degree content relevant and current.

Remember, WGU's competency-based approach lets you take advantage of your knowledge and skills, regardless of how you obtained them. Even when you do not directly receive credit, the knowledge you possess may help you accelerate the time it takes to complete your degree program.

Continuous Enrollment, On Time Progress, and Satisfactory Academic Progress

WGU is a "continuous enrollment" institution, which means you will be automatically enrolled in each of your new terms while you are at WGU. Each term is six months long. Longer terms and continuous enrollment allow you to focus on your studies without the hassle of unnatural breaks between terms that you would experience at a more traditional university. At the end of every six-month term, you and your program mentor will review the progress you have made and revise your Degree Plan for your next six-month term.

WGU requires that students make measurable progress toward the completion of their degree programs every term. We call this "On-Time Progress," denoting that you are on track and making progress toward on-time graduation. As full-time students, graduate students must enroll in at least 8 competency units each term, and undergraduate students must enroll in at least 12 competency units each term. Completing at least these minimum enrollments is essential to On-Time Progress and serves as a baseline from which you may accelerate your program. We measure your progress based on the courses you are able to pass, not on your accumulation of credit hours or course grades. Every time you pass a course, you are demonstrating that you have mastered skills and knowledge in your degree program. For comparison to traditional grading systems, passing a course means you have demonstrated competency equivalent to a "B" grade or better.

WGU assigns competency units to each course in order to track your progress through the program. A competency unit is equivalent to one semester credit of learning. Some courses may be assigned 3 competency units while others may be as large as 12 competency units.

Satisfactory Academic Progress (SAP) is particularly important to students on financial aid because you must maintain SAP to be eligible for financial aid. SAP is measured by the percentage of courses you pass and the number of credit hours you complete. The percentage of courses you pass is calculated by dividing the number of courses you pass by the total number of courses you attempt. The number of credit hours you complete is calculated by dividing the number of credit hours you complete by the total number of credit hours you attempt. The percentage of courses you pass and the number of credit hours you complete are used to determine if you are making satisfactory academic progress. If you are not making satisfactory academic progress, you may be required to repeat courses or withdraw from the program. For more information on SAP, visit [www.wgu.edu/sap](#).

required to demonstrate your skills and knowledge by completing the assessment(s) for each course. In general there are two types of assessments: performance assessments and objective assessments.



Standard Path *for* Master of Arts in Mathematics Education (Secondary)

Course Description	CUs	Term
Trigonometry and Precalculus	2	1
College Geometry	2	1
Calculus I	2	1
Mathematics Learning and Teaching	2	1
Calculus II	2	2
Probability and Statistics I	2	2
Probability and Statistics II	2	2
Algebra for Secondary Mathematics Teaching	2	2
Geometry for Secondary Mathematics Teaching	2	3
Statistics and Probability for Secondary Mathematics Teaching	2	3
Mathematics History and Technology	2	3
Mathematics: Content Knowledge	1	3
Mathematical Modeling and Applications	2	3
Calculus III	2	4
Linear Algebra	2	4
Abstract Algebra	2	4
Advanced Calculus	2	4
MA, Mathematics Education (5-12) Teacher Performance Assessment	6	5

Changes to Curriculum

WGU publishes an Institutional Catalog, which describes the academic requirements of each degree program. Although students are required to complete the program version current at the time of their enrollment, WGU may modify requirements and course offerings within that version of the program to maintain the currency and relevance of WGU's competencies and programs. When program requirements are updated, students readmitting after withdrawal from the university will be expected to

Areas of Study for Master of Arts in Mathematics Education (Secondary)

The following section includes the areas of study in the program, with their associated courses. Your specific learning resources and level of instructional support will vary based on the individual competencies you bring to the program and your confidence in developing the knowledge, skills, and abilities required in each area of the degree. The Degree Plan and learning resources are dynamic, so you need to review your Degree Plan and seek the advice of your mentor regarding the resources before you purchase them.

Mathematics Content

Trigonometry and Precalculus

Trigonometry and Precalculus covers the knowledge and skills necessary to apply trigonometry, complex numbers, systems of equations, vectors and matrices, and sequences and series, and to use appropriate technology to model and solve real-life problems. Topics include degrees; radians and arcs; reference angles and right triangle trigonometry; applying, graphing and transforming trigonometric functions and their inverses; solving trigonometric equations; using and proving trigonometric identities; geometric, rectangular, and polar approaches to complex numbers; DeMoivre's Theorem; systems of linear equations and matrix-vector equations; systems of nonlinear equations; systems of inequalities; and arithmetic and geometric sequences and series. College Algebra is a prerequisite for this course.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The graduate applies trigonometric ratios and triangle formulas to model and solve real-life problems.

The graduate uses a unit circle to define trigonometric functions and applies these functions to model and solve real-life problems.

The graduate proves trigonometric identities and solves trigonometric equations.

The graduate applies various representations of complex numbers to solve problems.

The graduate uses systems of equations, systems of inequalities, and matrices to model and solve real-life problems.

The graduate explores arithmetic and geometric sequences and uses them to model and solve real-life problems.

College Geometry

College Geometry covers the knowledge and skills necessary to use dynamic technology to explore geometry, to use axiomatic reasoning to prove statements about geometry, and to apply geometric models to solve real-life problems. Topics include axiomatic systems, analytic proofs, coordinate geometry, plane and solid Euclidean geometry, non-Euclidean geometries, constructions, transformations, deductive reasoning, and dynamic technology. College Algebra as well as Trigonometry and Precalculus are prerequisites.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The graduate applies algebraic language in representing geometric concepts to solve two-dimensional problems.

The graduate implements geometric construction methods to create objects.

The graduate applies properties and theorems about circles and circle sectors to solve problems.

The graduate applies geometric properties to solve problems.

The graduate examines geometric relationships to analyze congruence, similarity, transformations, and symmetry.

The graduate analyzes the axiomatic nature of Euclidean and non-Euclidean geometries to reflect on geometric reasoning and formal proof.

Calculus I

Calculus I is the study of rates of change in the slope of a curve and covers the knowledge and skills necessary to apply differential calculus of one variable and to use appropriate technology to model and solve real-life problems. Topics include

on accuracy and precision, hypothesis testing and statistical tests (z mean, z proportion, one sample t, paired t, independent

course plan together.

The graduate demonstrates understanding of vectors and fluency with vector operations and applications.

The graduate demonstrates understanding of functions of more than one variable and applies that knowledge to solve problems.

The graduate demonstrates understanding of the properties of series and their applications and determines the convergence of series.

Linear Algebra

Linear Algebra is the study of the algebra of curve-free functions extended into three-or-higher-dimensional space. It covers the knowledge and skills necessary to apply vectors, matrices, matrix theorems, and linear transformations and to use appropriate technology to model and solve real-life problems. It also covers properties of and proofs about vector spaces. Topics include linear equations and their matrix-vector representation $Ax=b$, row reduction, linear transformations and their matrix representations (shear, dilation, rotation, reflection), matrix operations, matrix inverses and invertible matrix characterizations, computing determinants, relating determinants to area and volume, and axiomatic and intuitive definitions of vector spaces and subspaces and how to prove theorems about them. College Geometry and Calculus II are prerequisites for this course.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The graduate demonstrates understanding of the properties and characteristics of vector spaces.

The graduate demonstrates understanding of linear transformations and their applications.

The graduate applies matrix theory and matrix algebra to model and solve problems.

The graduate applies propositional logic to solve mathematical problems.

The graduate applies predicate logic to solve mathematical problems.

Abstract Algebra

Abstract Algebra is the axiomatic and rigorous study of the underlying structure of algebra and arithmetic. It covers the knowledge and skills necessary to understand, apply, and prove theorems about numbers, groups, rings, and fields. Topics include the well-ordering principle, equivalence classes, the division algorithm, Euclid's algorithm, prime factorization, greatest common divisor, least common multiple, congruence, the Chinese remainder theorem, modular arithmetic, rings, integral domains, fields, groups, roots of unity, and homomorphisms. Linear Algebra is a prerequisite for this course.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The graduate demonstrates an understanding of important number theory principles, their applications, and proofs.

The graduate analyzes the characteristics of and proves theorems involving groups.

The graduate demonstrates understanding of the characteristics of and proves theorems involving rings.

The graduate demonstrates understanding of the characteristics of and proves theorems involving fields and subfields.

Advanced Calculus

Advanced Calculus examines rigorous reconsideration and proofs involving calculus. Topics include real-number systems, sequences, limits, continuity, differentiation, and integration. This course emphasizes students' ability to apply critical thinking to concepts to analyze the connections between definitions and properties. Calculus III and Linear Algebra are prerequisites.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The graduate writes mathematical proofs with proper mathematical notation and terminology to demonstrate their understanding of accepted mathematical conventions.

The graduate analyzes the real number system using precise definitions and theorems to develop an advanced

perspective.

The graduate analyzes limits of sequences using precise definitions and theorems to develop an advanced perspective.

The graduate analyzes functions of one real variable using precise definitions and theorems to develop an advanced perspective.

Mathematics Education

Mathematics Learning and Teaching

Mathematics Learning and Teaching will help students develop the knowledge and skills necessary to become a prospective and practicing educator. This course will help students use a variety of instructional strategies to effectively facilitate the learning of mathematics. It focuses on selecting appropriate resources, using multiple strategies, and instructional planning, with methods based on research and problem solving. A deep understanding of the knowledge, skills, and disposition of mathematics pedagogy is necessary to become an effective secondary mathematics educator. There are no prerequisites for this course.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The graduate integrates principles and models of teaching for understanding into learning activities.

The graduate integrates problem solving into learning activities to build conceptual understanding.

The graduate evaluates teaching tools and strategies for the purpose of planning learning activities.

The graduate evaluates learning activities for alignment with the National Council of Teachers of Mathematics (NCTM) standards.

The graduate incorporates standards and best practices for the teaching and learning of mathematics for all students into instructional practice.

The graduate uses multiple assessment strategies to evaluate student understanding and guide instruction.

The graduate accommodates the needs and abilities of diverse students in the planning of learning activities.

Algebra for Secondary Mathematics Teaching

Algebra for Secondary Mathematics Teaching explores important conceptual underpinnings, common misconceptions and students' ways of thinking, appropriate use of technology, and instructional practices to support and assess the learning of algebra. Secondary teachers should have an understanding of the following: algebra as an extension of number, operation, and quantity; various ideas of equivalence as it pertains to algebraic structures; patterns of change as covariation between quantities; connections between representations (tables, graphs, equations, geometric models, context); and the historical development of content and perspectives from diverse cultures. In particular, the course focuses on deeper understanding of rational numbers, ratios and proportions, meaning and use of variables, functions (e.g., exponential, logarithmic, polynomials, rational, quadratic), and inverses. Calculus I is a prerequisite for this course.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The graduate analyzes historical development, perspectives from diverse cultures, and content knowledge to deepen a student's algebraic understanding.

The graduate integrates instructional practices to support and assess students' understanding of algebra.

The graduate integrates technology to support and assess students' learning of algebra.

The graduate analyzes conceptual algebra underpinnings, common misconceptions, and students' ways of thinking to create opportunities to learn.

Geometry for Secondary Mathematics Teaching

Geometry for Secondary Mathematics Teaching explores important conceptual underpinnings, common student misconceptions and ways of thinking, appropriate use of technology, and instructional practices to support and assess the learning of geometry. Students in this course will develop a deep understanding of constructions and transformations, congruence and similarity, analytic geometry, solid geometry, conics, trigonometry, and the historical development of

content. Calculus I is a prerequisite for this course.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The graduate analyzes historical development, perspectives from diverse cultures, and content knowledge to deepen a student's geometry understanding.

The graduate integrates instructional practices to support and assess students' understanding of geometry.

The graduate integrates technology to support and assess students' learning of geometry.

The graduate analyzes conceptual geometry underpinnings, common misconceptions, and students' ways of thinking to create opportunities to learn.

Statistics and Probability for Secondary Mathematics Teaching

Statistics and Probability for Secondary Mathematics Teaching explores important conceptual underpinnings, common misconceptions and students' ways of thinking, appropriate use of technology, and instructional practices to support and assess the learning of statistics and probability. Secondary teachers should have a deep understanding of summarizing and representing data, study design and sampling, probability, testing claims and drawing conclusions, and the historical development of content and perspectives from diverse cultures. Calculus I is a prerequisite for this course.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The graduate analyzes historical development, perspectives from diverse cultures, and content knowledge to deepen a student's statistics and probability understanding.

The graduate integrates instructional practices to support and assess students' understanding of statistics and probability.

The graduate integrates technology to support and assess students' learning of statistics and probability.

The graduate analyzes conceptual statistics and probability underpinnings, common misconceptions, and students' ways of thinking to create opportunities to learn.

Mathematics History and Technology

In Math History and Teaching, students will learn about a variety of technological tools for doing mathematics and develop a broad understanding of the historical development of mathematics. Mathematics is a very human subject that comes from the macro-level sweep of cultural and societal change as well as the micro-level actions of individuals with personal, professional, and philosophical motivations. This course will focus on the historical development of mathematics, including contributions of significant figures and diverse cultures. Students will learn to evaluate and apply technological tools and historical information to create an enriching student-centered mathematical learning environment.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The graduate analyzes major historical developments and cultural contributions in number systems, algebra, geometry, calculus, discrete mathematics, statistics and probability, and measurement.

The graduate analyzes the historical development of methods in mathematics.

The graduate analyzes the humanistic, social, and political influences on mathematical discoveries and the applications and effect of those discoveries.

The graduate evaluates technological tools for appropriate use in a variety of situations.

The graduate utilizes appropriate industry-standard technological tools to solve problems.

The graduate integrates student-centered technology in the planning of learning activities to build understanding of mathematical concepts and promote creativity.

The graduate integrates mathematics history into the planning of learning activities to improve student learning.

Teacher Work Sample

MA, Mathematics Education (5-12) Teacher Performance Assessment

MA, Mathematics Education (5-12) Teacher Performance Assessment contains a comprehensive, original, research based curriculum unit designed to meet an identified educational need. It provides direct evidence of the candidate's ability to design and implement a multi-week, standards-based unit of instruction, assess student learning, and then reflect on the learning process. The WGU Teacher Performance Assessment requires students to plan and teach a multi-week standards-based instructional unit consisting of seven components: 1) Contextual factors, 2) learning goals, 3) assessment, 4) design for instruction, 5) instructional decision making, 6) analysis of student learning, and 7) self-evaluation and reflection.

This course covers the following competencies:

The graduate evaluates the teaching context to accommodate student differences to plan for instruction and assessment.

The graduate recommends improvements for instruction and professional practice through personal reflection.

The graduate plans learning environments that support individual learning, collaboration, and positive social interaction.

The graduate demonstrates ethical responsibilities and appropriate teaching dispositions, including those outlined in the Western Governors University Teachers College Code of Ethics.

The graduate plans comprehensive learning segments of instruction and assessment that align with standards and the needs of students.

The graduate applies instructional strategies that promote learning, engage students, and provide differentiated instruction.

The graduate recommends strategies that support the development of academic language for all students.

The graduate integrates strategies to develop academic language that facilitates effective student participation and engagement in learning.

The graduate utilizes assessment data to profile student learning, communicate information about student progress and achievement, and guide and modify instruction.

The graduate integrates a variety of strategies and resources to differentiate instruction and meet the needs of diverse learners.

The graduate evaluates teaching experiences including the planning and implementing of curriculum and instruction through ongoing reflection.

The graduate develops appropriate plans for professional growth in subject matter knowledge and pedagogical skills, including habits and skills of continual inquiry and learning.

Accessibility and Accommodations

Western Governors University is committed to providing equal access to its academic programs to all qualified students. WGU's Accessibility Services team supports this mission by providing support, resources, advocacy, collaboration, and academic accommodations for students with disabilities and other qualifying conditions under the Americans with Disabilities Act (ADA). WGU encourages student to complete the Accommodation Request Form as soon as they become aware of the need for an accommodation. Current and prospective students can reach the Accessibility Services team Monday through Friday 8:00 a.m. to 5:00 p.m. MST at 1-877-HELP-WGU (877-435-7948) x5922 or at ADASupport@wgu.edu.

Need More Information? WGU Student Services

WGU's Student Services team is dedicated exclusively to helping you achieve your academic goals. The Student Services office is available during extended hours to assist with general questions and requests. The Student Services team members help you resolve issues, listen to student issues and concerns, and make recommendations for improving policy and practice based on student feedback.

Student Services team members also assist with unresolved concerns to find equitable resolutions. To contact the Student Services team, please feel free to call 877-435-7948 or e-mail studentservices@wgu.edu. We are available Monday through Friday from 6:00 a.m. to 10:00 p.m., Saturday from 7:00 a.m. to 7:00 p.m., mountain standard time. Closed Sundays.

If you have inquiries or concerns that require technical support, please contact the WGU IT Service Desk. The IT Service Desk is available Monday through Friday, 6:00 a.m. to 10:00 p.m. and Saturday and Sunday, 10:00 a.m. to 7:00 p.m., mountain standard time. To contact the IT Service Desk, please call 1-877-HELP-WGU (877-435-7948) or e-mail servicedesk@wgu.edu. The support teams are generally closed in observance of university holidays.

For the most current information regarding WGU support services, please visit "Student Support" on the Student Portal at <http://my.wgu.edu>.